

## ABSTRACT

A method of determining optical constants  $n$  and  $k$  for a film on a substrate is described. Optical measurements are preferably performed with an integrated optical measurement system comprising a reflectometer, spectral ellipsometer, and broadband spectrometer such as an Opti-Probe series tool from Thermo-Wave. A beam profile reflectometer is employed to first determine the thickness of said film from a best fit of modeling data to experimental data. The thickness data is combined with the ellipsometer and spectrometer measurements to produce an experimental data output which is fitted with modeled information to determine a best fit of the data. Constants  $n$  and  $k$  are derived from the best fit of data. The method provides a higher accuracy for  $n$  and  $k$  values than by standard procedures which calculate  $n$ ,  $k$ , and  $t$  simultaneously. The method may also be applied to bilayer or multi-layer film stacks.